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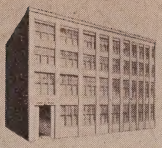

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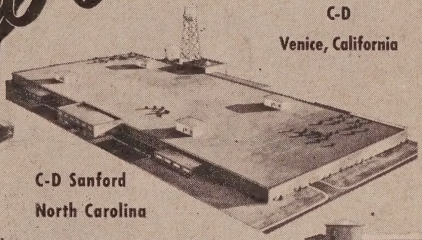

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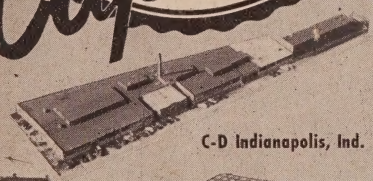

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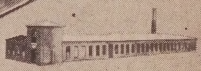

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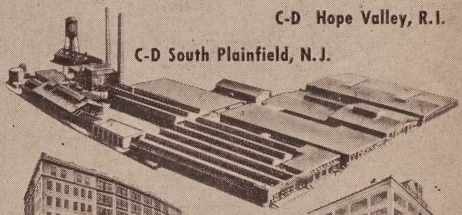

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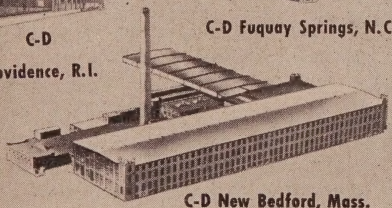

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Vol. 21 JULY, 1956 No. 7

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SUPPLEMENTARY APPLICATIONS OF THE GRID-DIP OSCILLATOR

The basic function of the grid-dip oscillator is checking the resonant frequency of tuned circuits. By employing the same technique with a different interpretation of the results, other measurements also are possible with this simple instrument. The widespread popularity of the grid-dip oscillator is due to this versatility as a multi-purpose r-f instrument. The supplementary uses of this instrument are as important as its basic frequency-measuring function.

The grid-dip is not a high-precision instrument, however its accuracy is adequate for most practical applications, especially first tests. The frequency accuracy runs from +2 percent in laboratory-type grid-dip oscillators to +5 to +7.5% in commercial and home-made models. Frequency ranges provided by various available units extend from 220 kc to 400 Mc in standard models, and up to 940 Mc in uhf types.

This article describes some of the important supplementary applications of grid-dip oscillators. From these applications, the reader will be able to devise similar tests and measurements to suit his particular demands.

Signal Source

Within its limits of accuracy, the grid-dip oscillator may be used successfully as a simple r-f signal source. It is particularly useful in applications requiring no physical connection to the receiver or other circuit under test.

Most grid-dip oscillators have no output control. However, some degree of signal attenuation may be obtained by decreasing the coupling between the GDO and receiver. To decrease the signal strength, for example, the GDO may be moved farther from the receiver.

Not all GDO's are amplitude-modulated, and this might be expected to impose some hardship when attempting to align a receiver or monitor by ear. However, most of these instruments have a small amount of power supply ripple on their carriers and this light modulation will suffice in many cases.

The GDO is convenient for supplying the signal for amateur VSWR meters and antenna impedance meters.

Capacitance Measurement

Capacitance of **non-electrolytic** capacitors may be measured indirectly with the GDO. In this scheme, the unknown capacitance (C_x in Figure 1) is connected temporarily in parallel with a coil (L_s) of accurately-known inductance. The resonant frequency of the combination is checked with the GDO, using the loosest possible coupling between L_s and the GDO coil, and the unknown capacitance then is calculated from the frequency (f) and the inductance (L_s).

To be sure that oscillator dip indicates the fundamental resonant frequency and not a submultiple, the GDO should be tuned from its highest

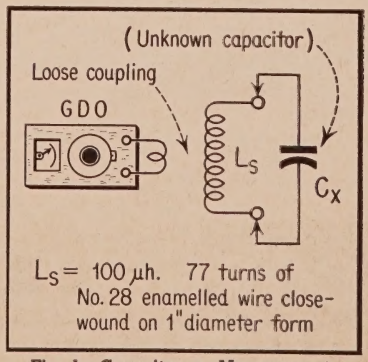

Fig. 1. Capacitance Measurement.

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operating frequency **downward.** At resonance, the unknown capacitance may be calculated with the aid of the following equation:

$$(1)\ C_x = \frac{25{,}400}{f^2 L} \text{ where}$$

C_x = unknown capacitance (uufd)
f = resonant frequency (Mc)
L = standard inductance (uh)

Example: An unknown capacitor is connected in parallel with a 2.5 millihenry coil. Resonance occurs at 150 kc. What is the value of the capacitance?

150 kc = 0.15 Mc, 2.5 mh = 2500 uh

$$C_x = \frac{25{,}400}{0.15^2\ (2500)} = \frac{25{,}400}{0.0225\ (2500)}$$

$$= \frac{25{,}400}{56.25} = 452 \text{ uufd}$$

To simplify computations, it is convenient to make the standard inductance, L_s, an even number of microhenries. A permanent coil having this value may be wound and used for testing capacitors. A useful value is 100 microhenries. The winding specifications of such a coil are given in Figure 1. When using this coil, Equation (1) is simplified to the following form:

$$(2)\ C_x = \frac{254}{f^2}$$

To eliminate the burden of computations when using the 100-microhenry coil, a capacitance chart has been reproduced in Figure 2. Here, it is necessary only to locate the GDO dip frequency along the horizontal axis and to find the corresponding capacitance along the vertical axis. Use the following guide to interpretation of the scales:

Frequency Range	Capacitance Range
0.1-1 Mc	0.025 ufd - 250 uufd
1-10 Mc	250 - 2.5 uufd

Inductance Measurement

Inductance measurement with the GDO is the opposite of capacitance measurement. That is, the coil, (L_x) of unknown inductance is connected temporarily in parallel with a capacitor (C_s) of accurately-known capacitance,

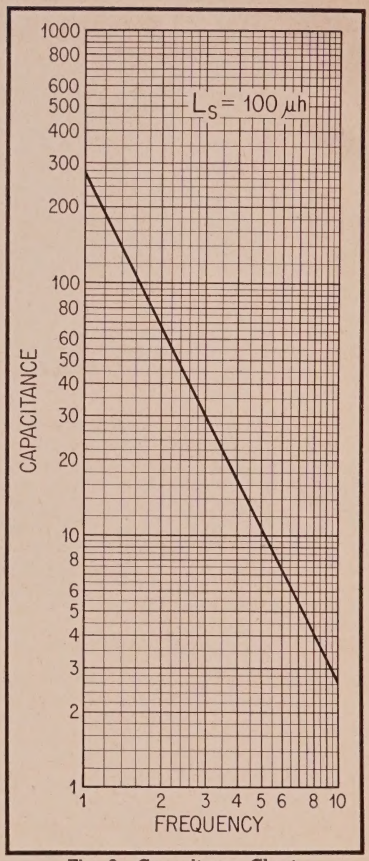

Fig. 2. Capacitance Chart.

as shown in Figure 3. The resonant frequency of the combination is determined with the GDO, and the inductance value then calculated from the equation:

$$(3)\ L_x = \frac{25{,}400}{f^2 C} \text{ where}$$

L_x = unknown inductance (uh)
f = resonant frequency (Mc)
C = capacitance (uufd)

Example: An unknown coil is connected in parallel with a 150 uufd

capacitor. The combination resonates at 2000 kc. What is the inductance value?

$$2000 \text{ kc} = 2 \text{ Mc}$$

$$L_x = \frac{25{,}400}{2^2(150)} = \frac{25{,}400}{4(150)}$$

$$= \frac{25{,}400}{600} = 42.3 \text{ uh}$$

To simplify computations, it is convenient to make the standard capacitance, C_s, an even number of micro-microfarads. A useful value is 0.01 ufd. When using this capacitance, Equation (3) is simplified to the following form:

$$(4)\quad L_x = \frac{2.54}{f^2}$$

When the 0.01-ufd capacitor is employed, the burden of computations may be avoided through the use of the inductance chart given in Figure 4. In using this chart, it is necessary only to locate the resonant frequency along the horizontal axis and to find the corresponding unknown inductance along the vertical axis. The following guide may be used to interpret the scales:

Frequency Range	Inductance Range
0.1 - 1 Mc	0.25 - 2.5 uh

With $C_s = 0.001$ ufd, the inductance range corresponding to the same frequency range becomes 2.5 mh – 25 uh.

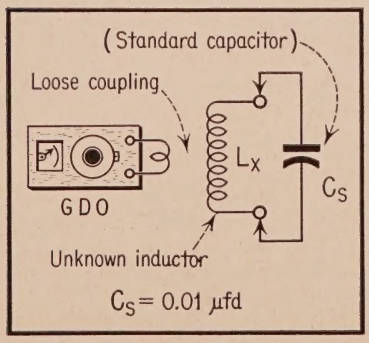

Fig. 3. Inductance Measurement.

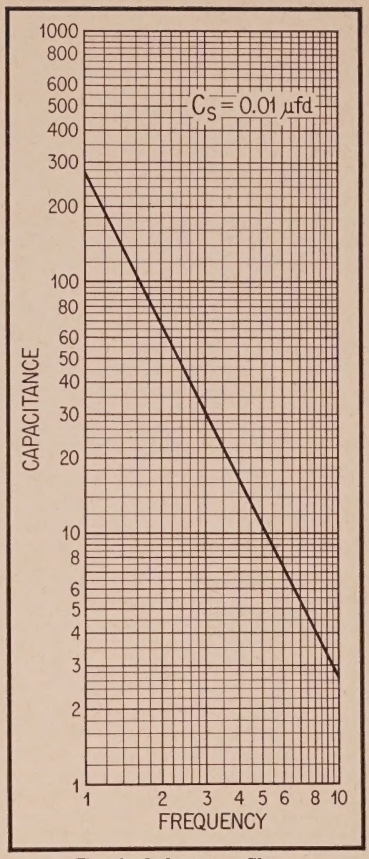

Fig. 4. Inductance Chart.

Checking Quartz Crystals

The setup shown in Figure 5 may be used to check the frequency of a quartz crystal. A small pickup coil is connected to the crystal, and the GDO is loosely coupled to this coil. The pickup coil may consist of 4 or 5 turns of insulated hookup wire jumble-wound 1 inch in diameter, although the exact number of turns might require adjustment in one direction or the other for best instrument response.

With some crystals, best results will be obtained only if a 0.005-ufd blocking capacitor is connected in series with the coil, as shown in Figure 5.

Maximum dip is obtained when the GDO is tuned to the crystal frequency. This test is most satisfactory with crystals which are intended for operation at their fundamental frequencies. In order to avoid harmonic responses, the GDO should be tuned downward from its highest operating frequency. The first resonance encountered then is the crystal fundamental.

A GDO test will reveal quickly spurious crystal frequencies. A run through the frequency spectrum immediately above and below the fundamental frequency will reveal these spots.

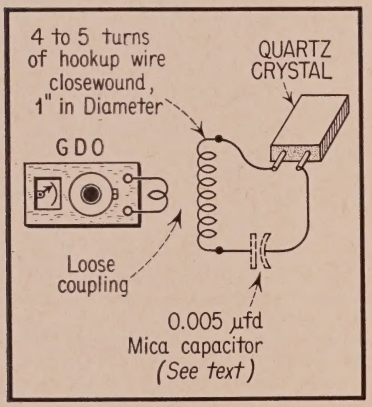

Fig. 5. Checking Crystal Frequency.

Checking Transmission Lines

A radio-frequency transmission line may be checked rapidly with a GDO tuneable to the resonant frequency of the line or to the test frequency of interest. The test setup is shown in Figure 6.

Inductor L and capacitor C are tuneable to the frequency at which the line is to be operated. For accurate measurements, the variable capacitor (C) should be direct-reading in micromicrofarads. The GDO is coupled loosely to L.

To ascertain if the line impedance is inductive or capacitive: (1) Disconnect the line from points A and B. (2) Set the GDO to the frequency of interest. (3) Couple the GDO to coil L, and tune C to resonance as indicated by the dip. (4) Connect the line to A and B. (5) Re-tune C to restore resonance. (6) If it was necessary to increase the capacitance of C to re-tune the circuit, the impedance is inductive. If C had to be decreased, the impedance is capacitive. If no change in tuning was necessary the impedance is resisitive.

An approximate determination of the equivalent input resistance (R_i) of the line may be made in the following manner: (1) With the line connected to A and B, and the GDO loosely coupled to L, vary C for resonance and note the **amount** of dip obtained. If the GDO has a meter indicator, note the deflection. If the indicator is an eye-tube, measure the width of the eye opening at resonance. (2) Next, disconnect the line and sub-

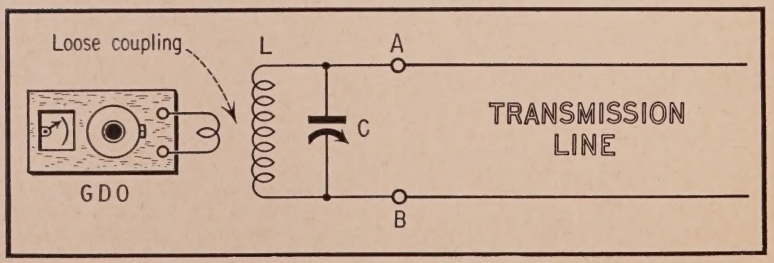

Fig. 6. Transmission Line Checking.

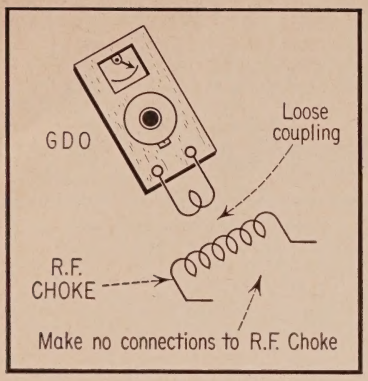

Fig. 7. Checking R-F Choke Resonant Points.

stitute a non-inductive resistor between A and B. (3) Do not disturb the setting of C but vary the value of the resistor until the same dip indication is obtained as in Step (1) preceding. (4) At this point, the value of the inserted resistance is equal approximately to the R_1 value of the transmission line.

Checking Radio-Frequency Chokes

The resonant frequency of a radio-frequency choke may be determined in a manner similar to the checking of inductance, except that the choke is not connected to a standard capacitor but "floats." The setup is shown in Figure 7.

Starting with the highest operating frequency of the GDO, tune downward, noting each frequency at which a dip is obtained. The lowest such point is the resonant frequency of the choke.

Sometimes, due to the large difference in size between the choke and the GDO coil, it may be difficult to secure the proper amount of coupling. In this instance, a single turn of insulated wire may be wound around the coil and the choke for better coupling.

Measuring Distributed Capacitance

The distributed capacitance of a coil is very important in governing the behavior of tuned circuits. A knowledge of this parameter is invaluable.

To use the GDO to check the approximate distributed capacitance of a coil: (1) Using the setup shown in Figure 3, resonate the coil at the frequency f_1 obtained with capacitance C_1. (2) Next, vary the capacitance to a value C_2 giving resonance at twice the first frequency (second harmonic, f_2). (3) The distributed capacitance, C_d, then may be calculated:

$$(5)\quad C_d = \frac{C_1 - 4C_2}{3}$$

where C_1, C_2, and C_d are in uufd.

Example: A certain coil resonates at 1000 kc with a capacitance of 200 uufd. At the second harmonic (2000 kc), a capacitance of 45 uufd is required for resonance. What is the distributed capacitance value?

$$C_d = \frac{200 - 4(45)}{3} = \frac{200 - 180}{3}$$

$$= 20/3 = 6.7 \text{ uufd}$$

The inductance value obtained by means of Equation (3) may be corrected for the effect of distributed capacitance by writing the capacitance in this equation as the sum of C and C_d.

Marker Production

Sweep-signal alignment generators of older design often are not equipped with pip-type marker oscillators. The GDO will furnish marker pips when it is loosely coupled to the receiver or other circuit being visually aligned, and is tuned to the desired marker frequency.

Extremely loose coupling is imperative in this application, since the GDO can deliver strong signals giving large pips that will distort the alignment pattern. Often merely placing the GDO near the circuit under test will provide sufficient coupling.

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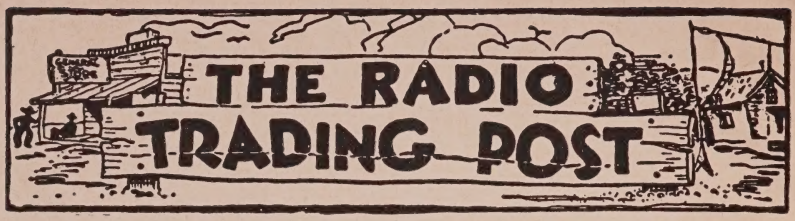
1. **Broadcast-Band Grid Dip Oscillator.** C-D CAPACITOR, October, 1951.
2. **A New, Sensitized Grid-Dip Adaptor.** C-D CAPACITOR, August, 1955.



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FOR SALE — 6 v. vibrator supply, 550 output @ 160 ma.; 12 v. dynamotor, 680 output @ 210 ma.; Telrad 18-A; BC-645; BC-459; 813, 2AP1; 16RP4; 1-KVA auto-transformer, 60 cy., 230-115 v.; all perf. cond. E. Dudis, 273 North American Blvd., Vandalia, Ohio.

FOR SALE — G. I. R85L recording chassis, $20; Espey 3" TV, $25; Sico TV10 tube tester, $25; Shure 55C, $25; Heathkit handitester M1, $10; Philco 48-700 TV with Frenel magnifier, $25. Arnold B. Margolis, 120-16 234 St., Cambria Heights 11, N. Y.

FOR SALE — Asst. of Radio books, test equipment; Presto recorder K-8. Want Chanalyst or analyst. J. C. Strickland, PO Box 633, Gainesville, Ga.

WANTED — 3", 5" and 7½" TV sets, portables or table models. State make, model, cond., price. S. Terchanyn, 394 Stone St., Johnstown, Pa.

FOR SALE — Hughes Mitchell VFO and power supply, $10; McElroy code keyer, photo tube type, $8. No shipping. W. Gately, 122 Wessington Ave., Garfield, N. J.

WANTED — Clamp-on type AC ammeter. D. C. Weber, Box 582, Ft. Myers, Fla.

FOR SALE — Hallicrafters SX-71 amateur 5-band comm. rcvr with instructions, like new, $179.50 FOB. L. J. Schnedorf, 610 Monroe Ave., River Forest, Ill.

TRADE — Have Eimac xmitting tubes and other ham gear to exchange for WE-350-B tubes; MI-1382 RCA 7" "Accordion" type loudspeakers. C. B. Dick, 111 Bridgeview Dr., San Francisco 24, Calif.

SELL OR TRADE — ATR inverter model RSB in perf. working order, $6.50 or trade for 6 v. DC power supply. Prefer local. John P. McCullen, 3050 Bainbridge Ave., Bronx 67, N. Y.

FOR SALE — Schematic diagrams R-28/ARC-5, BC-610, BC-614, BC-779, 30c each postpaid. S. Consalvo, 4905 Roanne Dr., Washington 21, D. C.

FOR SALE — Monitoradio mobile police comm. rcvr with master mobile antenna and remote control, 10-tube FM crystal controlled rcvr, model FMC-1L6, $85. Delmer Kerr, 349 Washington St., Springdale, Pa.

WANTED — Service manual for radio rcvr (surplus) CFT-46194, Johnston Matchbox. Caesar Arena, 1942 Pennington Road, Trenton 8, N. J.

WANTED — 3-speed turntable and arm, cartridge not necessary, prefer magnetic, must be working order and reasonable. Also want other Hi-Fi and tape recorder equip. R. A. Rosenquist, Box 2566, South Bend 14, Ind.

FOR SALE — 5" Heathkit oscilloscope and two 5BP1 cathode ray tubes, very good cond., $25. Will not ship. Joseph Golab, 175 Hopkins Ave., Jersey City 6, N. J.

WANTED — 6 P.F. binders; 5" scope, sig. tracer, VTVM. Will pay cash, must be reasonable and in good operating cond. Jacks Radio and TV Hospital, 8234 South Campbell Ave., Chicago 29, Ill.

SWAP OR SELL — 1949-50 Chev. auto radio, perfect, or radio-TV parts, tubes, for fishing equip. T. Wasek, Box 295, Rutherford, N. J.

FOR SALE — 12½" Philco table model 50T1403, $15.95. Will ship anywhere. Jones Radio, 1115 Rambler Ave., Pottstown, Pa.

WANTED — Miniature analyzer; adaptor for Supreme 593; Riders Vol. 10. T. Ferguson, 171 E. 91st St., New York 28, N. Y.

SWAP — Photometer; Stecky and Mercury cameras; 8 and 16 mm. projectors; ham gear; Heathkit and Waterman scopes; meters, for mobile rig, portable typewriter, photo and movie equip., power tools, test equip., AM-FM set, tape recorder. Joseph Leeb, 1380 Merriam Ave., Bronx 52, N. Y.

FOR SALE — 186 TV schematics, filed alphabetically, completely indexed, $15; complete NRI Radio-TV course, without kits, $18. H. Chasen, 343 E. 55th St., Brooklyn 3, N. Y.

SWAP — 3KP4 and few 12B8 tubes. Charlies Radio Service, 81 Warren St., Roxbury 19, Mass.

FOR SALE — Nine Sams Photofacts in good cond., with binders, $125, $25 down, balance COD plus postage. Also Mallory convertor, model TV 101-UHF-VHF, $20; TV boosters, $15. Kresky Radio & TV, 1330 Commonwealth Ave., Duluth 8, Minn.

SELL — Triplett 3413 tube tester, late chart; GE self-charging portable; National SW54 rcvr. C. Horn, 325 E. 163 St., New York 51, N. Y.

FOR SALE — Heath TV alignment gen., like new, calibrated, with xtal. model TS3, $38.50. Herman D. Wieck, 205 Idlewylde Dr., Louisville 6, Ky.

FOR SALE — Master antenna systems: TV Equip. Co. coupler, 8 prs., $22.50; Electro Voice coupler, 4 pos., $18; Industrial Auto-Bodsten, $10; all-channel amp., $22.50; Blonder-Tongue CA-1-M comm. antensifier, $45. Audio Corp. of America, 1111 E. Elizabeth Ave., Linden, N. J.

FOR SALE — RCA and Westinghouse tubes, overstock, at one fourth list prices. 6 BQ6, $1; 6 SN7, $.55; 6BQ7, $.80. George's Radio Repair, 3317 East St., Pittsburgh 14, Pa.

SELL OR TRADE — Rek-o-kut mechanism; 400-500 mc. xmitter-rcvr for Citizen's Band BC-645, half-price; Webcor model 80 wire recorder, $35 FOB. Gene, 1001 Merritt St., Old Hickory, Tenn.

WANTED — Full marine reverse gear for 60 hp. Ford V-8 engine, suitable for remote controls, 12 x 12 left hand prop. with 3 blades. E. H. Standridge, 1518 Terrace Dr., East Gadsden, Ala.

FOR SALE — Temco model 53C picture tube tester and rejuvenator, including all leads and instructions, $20; Simpson model 479 TV-FM sig. gen., exc. cond., all leads and operators manual, $225. Neches Radio & TV, 1105 Block St., Pt. Neches, Texas.

SELL OR TRADE — Viking II, factory wired, $219; S40B $79; S20R $35. Want Collins VFO, and grid dip meter. Ed Vernier, 19536 Gulf Blvd., Indian Rocks Beach, Fla.

SALE — Eico 425 5" scope, new type panel with probes, $95 values, for $65 cash; model 700 V-M tape recorder Hi-Fi, with accessories, specs. on request, $125. D. O. Marote, 51 Sherman St., New Bedford, Mass.

FOR SALE — S-38 Hallicrafters rcvr, $25; Philco console, 6 tubes, 1940 radio, $10. Anthony M. Weber, 1604 Eckert Street, Pittsburgh 12, Pa.

SELL OR TRADE — Hickok 203 VTVM and capacitor meter; Eico sweep gen., and oscilloscope; Philco signal gen. Need audio oscillator, late tube tester. A. Salsberg, 438 Saratoga Ave., Brooklyn 33, N. Y.

FOR SALE — DAK-3 direction finder; VHF power output meter WX-4614; TS170, IE36, RA120, TS14AP, TS69AP, OD3, OD7, tube testers. All clean condition. Sid Gordon, 215 Rochester Ave., Brooklyn 33, N. Y.

WANTED — Three 30 w. drivers and trumpets to match for outdoor amplifier. Swap TV set, scope, or cash. John Arnold, PO Box 84, Bluffs 3, Ill.

SELL OR TRADE — Heathkit FM tuner, $15; Sonnar 1.5 lens for Leica, $50 or comm. rcvr. Bob Spinillo, 565 No. Coles Ave., Maple Shade, N. J.

WANTED — Sams Photofacts, from 150 to date; UHF triodes, 416B and 417A; 4-1000A or larger tetrodes. R. Clark, 740 No. Gulf Blvd., Indian Rocks Beach, Fla.

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FOR SALE — Model 700 Hi-Fi tape recorder VM, in orig. box, never used, best offer over $150 plus freight. Matthew G. Beha, O'Neill, Neb.

WANTED — BC-344 surplus rcvr. Would like schematic, state cond., and price. N. C. Moseley, Littleton, N. C.

SWAP — Small Craftsman's lathe, with attachments, valued at $60, for 3" or 5" scope, or VTVM in good condition. What have you? Wm. Earl Powden, Rt. 1, Bridgeport, Ill.

WANT — Sweep-marker gen., rejuvenator, field strength meter, flyback-tester. J. Moser, R. 1, Lewisburg, Pa.

SELL OR SWAP — 500 receiving tubes, all types; Sams Photofacts; RCA manuals; test equip. Could use good comm. audio equip. Electronic Service, 4918 Beech St., Hammond, Ind.

FOR SALE — 2 Heath alignment gens., TS-3, G-3; scope 0-6; Webster wire recorder; Triplett tube tester 1183SC. Want audio gen., Precision or Hickok tube tester, 0-9 Heath scope, Scott rcvr. E. Cardona, GZB-10, Puerto Nueva, Puerto Rico.

TRADE OR SELL — Never used ARC-5 xmtr 40M, for TV booster or $10. W. M. Cook, 586 Service Ave., Sharon, Pa.

FOR SALE — Six 1200 ft. rolls recording tape, plastic base red oxide, $11; Mylar tape 2400 ft. on 7" reel, $6.70; Wilcox-Gay tape recorder, with mike, $65 prepaid. Dan Wolpin, Box 1153, Columbus, Ga.

SELL OR TRADE — Two like new 2C43 tubes (cost $21.50 each), for use as class "C" amplifier or oscillator. Want sig. gen. Joseph Teltsch, 1831 Southern Blvd., Bronx 60, N. Y.

WANTED — Good Univ. 4401 tweeter or equivalent and 2000 cps crossover network. Paul F. Bahr, 1013 Indiana SE, Albuquerque, N. M.

WANTED — Globe Scout or DX-100 transmitter, must be reasonable. Will consider either one needing repairs. Stanley J. Zuchora, 2748 Meade St., Detroit 12, Mich.

WANTED — Tech manual or circuit diagram for BC-499 FM rcvr. W. Bauer, 119 No. Birchwood Ave., Louisville 6, Ky.

WANTED — Late volt ohm milliammeter and good tube checker. Give cond., price, make, and model. Thomas Barni, 5331 Pattison Ave., St. Louis, Mo.

FOR SALE — Riders manuals Vols. 1 to 16, exc. cond., best offer. Nick Triantos, 3625 Fir St., East Chicago, Ind.

FOR SALE — Erec-Tronic set — make 15 different circuits, shortwave radio, wireless broadcaster and code practice unit, uses snap-on jiffy clips, with batteries, $12. Kenneth Schwieker, 4163 1st Ave. No., St. Petersburg, Fla.

SWAP — Termination contract material: tubes, sockets, test equip., condensers, resistors, for late model bench drill press. Full list price offered. Frank Dane, 4254 Niagara Ave., San Diego 7, Calif.

WILL TRADE — $20 3-D camera (uses 127 film), flash unit, and bag for resistor cabinet and 100 ½-watt resistors (specified values), or used 1950 Chev. radio, or intercom. S. O. Sellers, 2317 Ave. R, Birmingham 8, Ala.

SWAP — Tec-Craft 10 mtr. converter; SX-25 rcvr.; NC98; B&W dipper; other ham and test gear. Interested in photo equip. Ted Overbey, Iowa Park, Tex.

FOR SALE — ATR converter 6 v. DC to 110 v. AC, $32; 1000 v. DC power supply, 300 mills with 12 v. DC at 2 amps. and 12 v. AC at 12 amps. for transmitter, $75. Both used very little. T. Valenti, 1539 Curry Dr., Lyndhurst 24, Ohio.

WANT — Eico model 20 amplifier, wired or kit, without tubes; bridge seleniums, 250 ma. to 5 amp., 20 to 130 v. input; Collaro or Monarch record changer, with or without arm, 33-45-78. Eubank, 1227 Windsor Ave., Richmond, Va.

WANT — Control box for Alliance Tenna-Rotor, model HIR-2; also inside parts that go with Tenna-Top TV Booster, model 3010, made by Electro-Voice, Inc. Glen Johnson Radio Shop, RFD 3, Seymour, Tenn.

TRADE — Eico 425K oscilloscope, l. n., for late model tube tester; other pieces of test equip. to trade. Sam Berenblum, 417 Greenwich Ave., Greenwich, Conn.

WANTED — Recent CREI courses: Section I, Introduction to Practical Radio-Electronics Eng.; Section II, Advanced Practical Radio-Electronics Eng.; Section V, Specialized Television Eng. Must be complete and reasonable. E. F. Kinghorn, 214 So. Memminger St., Greenville, S. C.

SWAP — 3 TV sets, 16" console, 12" table model and 7" table model, for 32 ft. magnesium extension ladder, will consider aluminum. Prefer local. E. Greenblatt, 26 Potterlane, Levittown, N. Y.

FOR SALE — Phone patches, exc. cond., reasonable. Elliot Taynor, 64-55 Bell Blvd., Bayside 64, N. Y.

FOR SALE — BC-221 AK AC supply, not calibrated, best offer over $50; Hickok meter, model 50, 0-15 microamps, $10; Jr. voltohmyst, $10. M. Farrow, Box 153, So. Sudbury, Mass.

FOR SALE — Hallicrafters S-20-R with separate tuning eye, $35; Supreme 910 tube tester, $15. N. Y. area. Herbert Paskin, 377 Central Ave., Brooklyn 21, N. Y.

FOR SALE — Hallicrafters SX-32 with spkr and xmitter; pair 807's mod. by P.P. 807, self-contained audio, drivers, power supplies, $150. Prefer local. Jan Solomon, 891 Dawson St., Bronx 59, N. Y.

WANTED — Complete Hi-Fi setup: spkrs, amplifier, AM-FM tuner, all complete, like new. Write for details. Freedman, 144-34 72 Dr., Flushing, L. I., N. Y.

FOR SALE — Transoceanic $90; Motorola AM-FM tuner, VK101-VF102, $23.50. More information on request. Harold Gruen, 633 No. Penna. St., Indianapolis 4, Ind.

WANTED — Sams Photofacts in folders and cabinet, from 100 up, 101 to date, radio folders only, no TV or complete with TV. Need good radio service parts tubes in orig. cartons, priced right. Walter Fralick, R. 1, Marion, Ky.

WANTED — Harmon Kardon AM or FM tuner; Heath audio oscillator; Pickering cartridge. Have Hi-Fi unit to sell. Theodore Nadeje, 5101-AA 39th Ave., Sunnyside 4, N. Y.

WANTED — VTVM, any make. Cash or swap for model 5 Underwood typewriter, power tools. Schneider, 9409 Ave. A, Brooklyn 36, N. Y.

FOR SALE — Like new 6HSH ATR DC-AC inverter, 110 v. AC, 125-150 w. output; and 6V C-D 6R5 Power Con vibrator converter, 110 v. AC, 50-55 w. output. Any reasonable offers accepted. E. C. Horacek, Rt. 2, Box 117, Yankton, S. D.

SELL OR TRADE — ARC-5 rcvr, 110 v. (3 to 6 mc.), converted; also Argus 21-35 mm. camera. Douglas G. Phelps, 10 Smith St., Sidney, N. Y.

WANTED — Coil and condenser tester, used for tractor and car magneto and distributor. Frank Almeter, Box 166, Mazeppa, Minn.

FOR SALE — GE type YGA-4 audio oscillator, $20; 12 x 50 prism binocular, coated optics, with case, $35; 1.5" f3.2 8 mm. telephoto lens in focus mount, $12. Richard F. Reed, 2054 Bradley, Ypsilanti, Mich.

FOR SALE — Hickok tube tester, like 600A but with factory added leakage sensitivity switch, $110; Simpson 479 sig. gen., $260. Both l. n., complete with leads and manual. Prefer local. W. Raucher, 3819 W. 82nd Pl., Chicago 29, Ill.

FOR SALE — Two BC-625-A transmitters; four 4-125A and six 832A tubes. E. L. Felder, Tylertown, Miss.

SELL OR TRADE — Remington No. 10 typewriter, unused BG-1 bar gen., FM Pilotuner, Zenith 6G 601M portable radio. Want sweep gen., multimeter, particularly interested in RCA WO57B 3" scope. Walter E. Niemiec, 227 Fairway Drive, New Hartford, N. Y.

WANTED — RCA TV Picto-O-Guide, Vol. 1. State price and cond. James Hardman, Rt. 2, Box 5643, Oxford, Ohio.

FOR SALE — Complete (100 lesson, $100), Coyne School TV course, l. n. Make offer. H. Gehring, 1200 Stockwell Blvd., El Paso, Tex.

WANTED — Refrigeration home study course, tools, books. Durkin's TV, 1465 Third Ave., New York 28, N. Y.

WANTED — All types of socket punches, round and keyed, all sizes of square punches for chassis work. Cash or swap new tubes. Marvin Gurlin, 111 White Horse Pike, Audubon 6, N. J.

SELL OR TRADE — Weston model 689 ohmmeter, $5; 2" Westinghouse 0-9 RF ammeter, $1.50; Navy ARB rcvr, $10. Want 50-0-50 DC 2" ammeter. George Hausske, 1922 E. Indiana St., Wheaton, Ill.

WANTED — Schematic diagram of 21" Windham TV, model 14S1-200, Serial No. 59172, or information on picture tube number. Robert E. Henning, 110 N. Front St., Darby, Pa.

FOR SALE — Six 2 mfd - 2500 v. cond., $2 ea.; five 0.5 mfd - 3000 v. and five 0.1 mfd - 5000 v. cond., $1 ea., all oil filled; five 120 ohm - 100 w. res., $1 ea. S. S. Brody, 211-10 73rd Ave., Flushing 64, N. Y.

SELL OR TRADE — Solar voltage regulator completely automatic, load range 175 va. to 300 va. Louie L. Merrithew, 62 Sunnyside St., Hyde Park 36, Mass.

FOR SALE — Test equip. and electronic parts. Paul W. Conner, 1208 Pullman Rd., Moscow, Idaho.

SELL OR SWAP — Armature and field coil tester, l. n., $15; CTS electrical appliance repair course, 1955, $20; Motorola AM-FM radio, l. n., $20; Detrola BC-438 range rcvr, $15. Robert Gelnett, R. 2, Liverpool, Pa.

FOR SALE — Test equip., manuals, tech. books, parts and tubes. J. Watts, 13343 Glenfield Ave., Detroit 13, Mich.

FOR SALE — Miles Recordall model CCB, extra belts and briefcase, $175. Dale Fetrow, O'Neill, Neb.

WANTED — Isolation transformer, 250 w. or more. Local preferred, state price, model, make and cond. R. Chlupsa, 45-56 189 St., Flushing 58, N. Y.

FOR SALE — C-D converter, 250 w., $20; 813 $8; 812 $3; 210 $2; 866A $1.50. M. Binder, 1591 Fulton Ave., Bronx, N. Y.

WANTED TO BUY — RCA 45 rpm record changer and base only. Albert C. Hart, 207 No. Raymond St., Griffith, Ind.

TRADE OR SELL — Shoe shop machinery complete, for good late model tube tester, sig. tracer, VTVM, scope, resistor-condenser checker, sig. gen., 6-12 v. power supply. Richard Garcia, 119 E. Main St., Anadarko, Okla.

FOR SALE — Precision E-200C sig. gen., $50; E400 sweep gen., $110, including cables, crystals, and instructions. Never used. Daniel F. Basile, 2013 No. Leavitt St., Chicago 47, Ill.

SELL OR TRADE — Model 3010 Electro-Voice Tenna Top TV booster with automatic control unit, good cond. Want 2-meter ham gear or 7" TV. R. L. Ludlum, 824 San Miguel Rd., Concord, Calif.

SELL OR SWAP — GE 260 portable radio, Pilot T601 FM tuner in cabinet, S-40 Hallicrafter SW rcvr. All in good cond. Chet. Wesoloski, 7521-60 Place, Summit, Ill.

SELL OR SWAP — Surplus tubes, test equip., manuals, etc. Send for list. What have you? E. Dunn, Rt. 2, Jefferson City, Mo.

FOR SALE — To liquidate service business of deceased, test equip., tubes, parts, components, etc. Write for list, make offer or call and examine material. Mrs. Abner Crumb, 5869 Hobart St., Pittsburgh 17, Pa.

FOR SALE — Simpson model 392 AC-DC volt-wattmeter, ranges, volts 0-130, 0-260, watts 0-1000, 0-5000, perf. cond., factory reconditioned, $30 FOB. B. Blatt, 8 First St., Haverstraw, N. Y.

FOR SALE — 2 Fisher 70AZ, Fisher 50C, and 3 Pilot 420 amplifiers, all $69 each; Harmon - Kardon A-100 FM-AM tuner, $39.50; Bogen R-640 FM-AM tuner, $74.50. L. Wiener, 17-42 166 St., Whitestone, N. Y.

FOR SALE — 6 surplus 2K28's. Best offer per tube or by the lot. Will Jackson, Box 5631, Washington 16, D. C.

WANTED — Gonset converter 10-20-40 meters, for car radio. William H. Paul, 8 Laurel St., Boston 19, Mass.

SWAP — Tenna rotors; meters; cooling fans; motors 110 v.; antennas. Need oscilloscope, ARB rcvr, VTVM or ?? Thomas Rohland, R. R. 3, Martinsville, Ind.

FOR SALE — RCA Rider chanalyst, complete, probes and book, $40. Good shape, local only. L. Matushefske, 2 Elmont Rd., Elmont, L. I., N. Y.

FOR SALE — BC-348M rcvr, BC-696, BC-459; vibroplex champion key; 400 v. - 150 mill power supplies. G. Richards, 501 Central St., Stoughton, Mass.

FOR SALE — Shure crystal mike; GE AI-900 record compensator; GE AI-500 de luxe tone arm; Stancor output A-2313. J. Holloway, 1421 Arch St., Philadelphia 2, Pa.

SELL OR TRADE — Collins 30J xmitter, $350, or trade towards smaller set, like 32V2 or 3, balance the difference. Leo Meister, 321 River Rd., Nutley, N. J.

SWAP — Supreme 504 tube tester for .22 auto. or revolver or comm. rcvr. Also have Sams, Riders, etc., manuals to swap. K. Radziewicz, 846 Bergen St., Newark 12, N. J.

SELL OR TRADE — Back number radio tubes, perfect; special purpose 1N21B, 1N28, 359A, 956, CHS7248, 900; binoculars French Sportiere Hi-power, case and strap; Conestoga FG66 cord, no case. Peter Carriero, 2260 Haviland Ave., Bronx 62, N. Y.

FOR SALE — Kay megasweep, $150; RCA 39A TV crystal calibrator, $65; T1C RF 1210 Wobbulator $250; T1C 1900 multi-frequency crystal gen., $60; RCA 306A audio frequency meter, $100. Vincent Iavarone, 1218 Leland Ave., Bronx 72, N. Y.

SELL OR SWAP — Commercial band-switching 750 w. xmitter, 1.5 to 18 mc., phone, cw or mcw; switch selection of 5 crystals or temperature-stabilized Colpitts VFO, no TVI, $500 FOB, or Viking II plus $200. Elmer Long, 1128 East Kibby, Lima, Ohio.

TRADE — Recent DeForest's course on FCC commercial operators exam., for code course on record. Dean Davis, 3405 Ryan St., Lake Charles, La.

FOR SALE — SX-42 Hallicrafter, matching R42 spkr, $140. Good cond. Ed. J. Morgan, 1631 No. 52nd St., Philadelphia 31, Pa.

WANTED — Gonset FM comm. tuner, model 3012, 152-162 mc., mobile. State price and cond. J. Soltis, 218 Third St., Passaic, N. J.

WANTED — Used I.C.S. courses or misc. I.C.S. lesson texts, any subjects. State copyright date, subject and number of lessons. G. Crapsi, 251 No. Ellicott St., Williamsville 21, N. Y.

SELL OR SWAP — Eico 322K signal gen., calibrated on all bands. Want model 1050K battery eliminator or 944K flyback xformer and yoke tester. Gerald Kernan, Harpers Ferry, Iowa.

FOR SALE — Eico 221 VTVM, factory calibrated, almost new, $25; BC-455 converted, ready to use, $7. Marl Desens, R. 3, Litchfield, Minn.

SELL — Ten watt all triode Hi-Fi with AM tuner, Garrard RC-80 changer, GE cartridge, Utah 12" coaxial spkr in refinished cabinet, $125; 10 w. amp. with preamp, jack for instruments, $30. R. Laurora, 2546 Fenton Ave., Bronx 69, N. Y.

SELL OR TRADE — .22 Hornet Winchester with Weaver K10 scope, $120, or trade for radio tools: chassis punches, drill, or best offer. Frank Tarantino, 16-6th Ave., Newark 4, N. J.

FOR SALE — BC-348 with extra audio and 110 v. $50; Meissner deluxe sig. shifter VFO with coils for 80, 40, 20, 10, $25. Wally Ives, Medford, Wis.

WANTED — Gonset 3009, 3010, 3012; RME MC55; Morrow 5BR1; Hallicrafters S94, S95; Police Alarm PR9, PR31; Monitoradio MR10, MR33, DR200. Buy or trade. C. Leo Clak, 273 Fairgreen, Youngstown 4, Ohio.

SWAP — Hallicrafters S38 rcvr in like new cond. for oscilloscope. Carl Gaines, 2117 Vyse Ave., Bronx, N. Y.

FOR SALE — Radio and TV Sales and Service. Established 1931. Reasonable rent or will sell property consisting of four residential units, plus store. Bob Brown Radio, 2051 W. 54th St., Los Angeles 62, Calif.

FOR SALE — Like new Eico 400 oscilloscope, $17.50; unused Key cutter duplicating cylinder and flat steel keys, $30. Julien De Wolf, 14751 Tacoma Ave., Detroit 5, Mich.

WANTED — Electro Voice - Patracian, Georgian 4-way system or Jensen G610 triaxial, H-510 coaxial. State cond., and price. John T. Lusk, 50 Sawyer St., Hornell, N. Y.

FOR SALE — Riders Vols. 2 thru 5; RCA Service Notes '34; Trouble Shooter's Manual '29 and '31; Official Radio Service manual. All like new condition. Best offer. James Patterson, 153-15 89 Ave., Jamaica, N. Y.

WANTED — Heath DX-100, Lysco 600-S, or Stancor 202-A transmitter. Swap VFO, speech amplifier-modulator 200 w., audio output meter, field strength meter. H. E. Leigh, Sr., 828 Nevada Ave., San Jose 25, Calif.

FOR SALE — Photofacts misc. folders and 101 thru 212, 230, 235, $1 ea.; Heath: C3 $10, 0-9 with probes $50, SG-8 $10, TC-2P with picture tube adaptor $30, BG-1 $10. All l. n. D. H. Miller, 601 Harrison St., Taft, Calif.

TRADE — Riders manuals 1-5, 6 to 15 in A-1 cond., for amateur equipment. Stan Phillips, 6004 Sarvis Ave., Riverdale, Md.

WANTED — Hickok model 533P tube tester, like new condition, reasonable. Paul Capito, 637 W. 21st St., Erie, Pa.

FOR SALE — T23-ARC5 $20; BC-1206 $8; RCA rec. ACR136 $15; Motorola FMT30D mobile trans. converted to 10 with class B mod. and dynamotor $30; aluminum rack 46" x 24" x 22" $10. J. Wasiewicz, 74 Canterbury Rd., White Plains, N. Y.

WANTED — Superior Powerstats, type 10, 1.25A for cash or trade radio parts. Richard H. Rogers, 28 Bellamy St., Boston 35, Mass.

WANTED — Police Alarm rcvr 30 to 50 mc. band. State cond. and price. W. L. Aufmuth, 13432 Darley Ave., Cleveland 10, Ohio.

FOR SALE — 20 w. amplifier kit, complete, except speaker, $12.50; amplifier 3 w., except spkr, $5 FOB. A. Agostino, 223 So. Winebiddle Ave., Pittsburgh 24, Pa.

FOR SALE — National NC-88 with S-meter in matching external case. Both l. n. and in perf. working order, less than 1 year old, with instruction manual, $95 FOB. Gary C. Clifton, Orchard, Neb.

FOR SALE — All Precision: 864 VOM 9" meter, $25; 10-12 tube tester, $60; ES-500 scope and probes, $130; CR30 cathode ray tester, $65. All in good condition. Precision Service Co., 937 Center St., Brockton, Mass.

SELL OR TRADE — Hallicrafter S-38A with service manual, perf. cond. Want good photo camera. R. Garcia, 300 W. 17th St., New York 11, N. Y.

FOR SALE — Elco violet ray; vibrator and ozone inhaler machine, uses 115 v. AC 60 cy. Best offer. Aug Palmer, 2230 Winebiddle Ave., Pittsburgh 24, Pa.

FOR SALE — Antenna tower triangular 10" x 22 ft., including Hy-Lite 3-el 10-meter Jr. beam less boom $30; 2 meter ground plane antenna complete with 10 ft. mast, stainless steel chimney mounting straps and co-ax, $10. You pick up. Pyryt, 192 Norman Way, Paramus, N. J.

FOR SALE — All-band 1 kw. transmitter, P.P. 813's, modulator 805, multimatch xformer, variac control supply, 700 v. exciter, 6 ft. cabinet, meters, tubes. Robert Ziolkowski, 30 Van Nostrand Ave., Jersey City 5, N. J.

WANTED — Schematic diagram, and/or instruction book for model BC-997 radio rcvr, Signal Corps. Cash. G. Stout, Box 378, Secane, Pa.

WANTED — Hammarlund MC-140S; MCD-140M; MC-325-M and Johnson 15M11 capacitors; Triad A-31X interstage and UTC S-19 mod. xformers; Simpson 0-10 ma. DC model 127 meter. Robert Camp, 1042 Water St., Moosic 7, Pa.

SELL — Unused xmitting tubes: 832, 829B, 814, 811, T40, 807, 866, six of each. Also slightly used pair of 4E27. Best offer for any or all. R. S. Krebs, 1739 East Susquehanna St., Allentown, Pa.

WANTED — Used TV tower, self-supporting type, 25' or higher, good cond. a must. State price and height. Lee Singleterry, 1914 Ballinger Rd., Seattle, Wash.

FOR SALE — Service test oscillator (Jewell); radio set analyzer; AC tube checker; Weston radio analyzer; Supreme tube tester; Rider Chanalyst (RCA). Ernest J. Ryan, 20 Sumerset St., Boston 8, Mass.

FOR SALE — Sigma 4F relay, in original carton, good cond., used once, specification No. 8000S. Make offer. Anthony Bruno, 6812 11th Ave., Brooklyn 19, N. Y.

WANTED — Early Capehart catalogues, 400 series, service data on model 406R, any coils used in old Meissner manuals, celluloid dial for Meissner 14-tube Traffic Master. L. Marks, 14 Avenue Rd., Kingston, Surrey, England.

TRADE — Geiger counter probe type, like new, for test equip. or commercial rcvr. G. E. Stowers, 2020 East 48th Terr., Kansas City, Mo.

FOR SALE — Temco model 75-GA 100 w. phone-CW xmitter, bandswitching, all bands, exc. cond., complete with low pass filter, Baluns, phone patch, and mike. Charles E. Remick, 7 Elizabeth Pkwy., Eatontown, N. J.

SWAP — Hand-operated small Jap field generator, 6 and 200 v.; Pilot 3" TV; RCA 17" TV; FM tuner; Hickok model 209 VTVM, for old American Moto Scoot or other scooter, winch, speed reducer, or Crosley auto. M. Gordon, 140 Washington Ave., Vandergrift, Pa.

SELL OR SWAP — Meters AC-DC, motors, misc. building hardware. Want electronic test equip. Keidanz, 1351 Boynton Ave., Bronx 72, N. Y.

FOR SALE — Revere T11 professional tape recorder, l. n., in orig. carton, accommodates all size reels, can be vertically mounted, with 2½ w. monitoring amp. Guaranteed, $180. Leon Kuby, 1472-52nd St., Brooklyn 19, N. Y.

FOR SALE — ATR inverters, 110 v. DC to 110 v. AC, RSB and RSC 150 w. cont., also, RHC 350 w. cont. spare vibrators; Meissner deluxe sig. shifter with coils, 160 thru 10 meters. Both in exc. cond. J. P. Andrasko, 223 E. 96th St., New York 28, N. Y.

FOR SALE — DeForest Radio-TV course, about 2½ years old, all lessons, minus kits. Make offer. D. J. Recktenwald, 345 E. 58th St., Seattle, Wash.

FOR SALE — Hickok 533AP tube tester, orig. carton, perf. cond., new roll chart, cathode ray tube adapter included. Will sacrifice for $150 cash, you pay shipping. W. J. Schneider, 1014 Cornell Avenue, Albany 6, Calif.

FOR SALE — HQ-129X with speaker, $125; National HRO-5RA1, $150; Hallicrafter S-40B, Heath AT-1 and Heath antenna coupler, all for $110. Want good mobile all band xmitter. N. K. Stover, Box 722, York, Pa.

FOR SALE — Sonar mobile 2-meter MB-26 trans.; Gonset 2-meter converter PE-101; Sonar 10-20-80 meter rcvr SX28A; E-400 sweep gen.; Gothard SP-17 dynamotor; 3" Pilot TV Bliley crystal control osc. 7 crystal. A. Turturro, 146-26 No. Hempstead Tpke., Flushing 55, N. Y.

FOR SALE — Elmac PMR6A, 6 v., $115; Meissner freq. standard, $25, and 8-C FM tuner, $20; 250 w. fone-CW xmitter, $150; Heathkit condenser checker, $15. William A. Moose, 12628 Kelly Road, Detroit 24, Mich.

SELL OR SWAP — Hallicrafters S-40 rcvr, perf. cond., best offer, cash or trade. Electro-Voice 630 mike, l. n., $20. Dick Rogers, 28 Bellamy St., Boston 35, Mass.

FOR SALE — Wilcox-Gay 2A10 tape recorder, exc. elect. and mechanical cond., engineer-owner has made several improvements, $75; Meissner 8C FM tuner with increased sensitivity, perf. cond., $25. Local. J. Saldana, c-o WBNX, New York 51, N. Y.

FOR SALE — McMurdo Silver 8-tube comm. rcvr; xtal filter band spread BFO RF audio gain and BFO pitch controls, covers broadcast band to 22 mc., exc. cond., $20. G. A. Valdes, 417 Sycamore Ave., Croydon, Pa.

WANTED — 7JP4 cathode ray tube, portable TV set and pocket radio (any make). Will trade tubes, parts, Weston meters, radio books. Harry Gursh, 1481 Shakespeare Ave., New York 52, N. Y.

FOR SALE — BC-645 complete with tubes, unmodifled, $25 FOB; phone patch, guaranteed, $4 postpaid in U. S. Epps Grfiffin, Box 1074, Mt. Pleasant, Tex.

WANTED — Complete radio course without kits, not more than five years old. State price. James Donaghy, 35 Montclair Ave., Roslindale, Mass.

WANTED — Comm. type modulation transformer (approx. 200-3000 cycles) capable of delivering audio output of 1000 watts or more. Durward J. Tucker, c-o WRR, Dallas, Tex.

WANTED — World Transcriptions with 200 and 300 prefix numbers. Offer $5 to $10 for early items. James Orlando, Dickerson Run, Pa.

FOR SALE — Emerson portable disc recorder $25; Teleplex AC-DC CW tape osc. and cutter $30; 10 mtr MM whip and mount, stainless, $9; complete all-band mobile 35 w. station. All excellent. Hanson, Costa's Trailer Court, Rt. 46, Lodi, N. J.

FOR SALE — Best offer for 2 kw GE transformer 115/230 to 115/230/460 v. 60 cy.; variable voltage xformer 1 to 2 kw. 115/230 pri., sec. 0-125/0-250 v., 60 cy. D. Buck, 32 Ardmore Terr., Collingswood, 7, N. J.

SWAP — Ham gear, test equip., tubes, manuals, books, Sams TV course, etc., for fishing gear, hunting equip. Need two 1000 v. DC plate xformers. Jim McCoy, Raderville Rt., Casper, Wyo.

FOR SALE — Hallicrafters S-82 Civic Patrol rcvr, 30-50 mc., looks and performs like new, $35 plus shipping. Leon J. Kamienski, 134 E. Whitehall, Northlake, Ill.

FOR SALE — National NC-98 amateur rcvr with instruction manual, like new, $90, or reasonable offer considered. Lt. R. M. Rubin, 136 Ringdahl Ct., Rome, N. Y.

FOR SALE — Hallicrafters SX-62 rcvr and R-46 speaker, $125. Joseph J. Daley, 416 Stuart St., Green Bay, Wis.

RADIO & TV SHOP FOR SALE — Rent $50 five-year lease, good location, $3,000. Half block from high-advertised miracle mile shopping center. N. Smith, 3245 24th St., San Francisco 10, Calif.

FOR SALE — Back numbers on QST, Radio and Electronics, Popular Mechanics, Science and Mechanics, and Mechanics Illustrated. Sue-Bob-Lens Radio Shoppe, PO Box 177, Beverly, Mass.

WANTED — Rimco sig. tracer in first-class cond., with all the orig. accessories, probes. Give details. C. Jenkins, 1905 Queen Anne Ave., Seattle 9, Wash.

SELL OR TRADE — Professional disc-recording equip., complete or individual parts, Riders 1-13, for best offer. Want scope, professional tape recorder, Crown Broadcaster, Magnecord, Ampex or similar. John T. Moore, PO. Box 63, Seneca, S. C.

FOR SALE — Clippard Signalette multi freq. gen., model SE-1, for testing radio and TV circuits, guaranteed $7.75 postpaid. H. D. Fry, 6200 Wayne Ave., Philadelphia, Pa.

SELL OR TRADE — Eico 950B capacitor tester and TV booster BB2, like new, for scope. C. J. Schexnayder, 200 Shreveport Ave., Port Arthur, Tex.

FOR SALE — Lysco 600S, Eico 625 tube tester, Eico 400 5" scope. Want Viking I or II, will take as is. G. V. Wintriss, 409 Clairmont Dr., Pensacola, Fla.

FOR SALE — Unused Hallicrafters SX-100 with instruction book, shipped express collect to first offer. David Underwood, Greene, R. I.

SWAP — BC-659 FM transceiver, 28-39 mc., crystal controlled on two freqs., with tubes, built-in meter and spkr., diagram, parts list, without power supply. Want military binoculars, transistor radio or lapidary equipment. H. L. DeWalt, 10 Hawthorne, Brownsville, Tex.

WANTED — Tube tester type filament transformer, any make, preferably with 28 and 48 v. taps, and TV chassis, no parts. Reasonable price. Leo J. Heffernan, 12 Ronan St., Hillcrest, Binghamton, N. Y.

FOR SALE — Seco TV grid circuit tester, model GCT-3, $17.50; Heathkit PS3 variable voltage reg. power supply, $22.50; Heathkit TS-3 align. and marker gen., $37.50; Heathkit sq. wave gen., model SQ-1, $18.95. Ron's TV Service, Central City, Neb.

SELL OR TRADE — Standard 19" panel types: 36" Bud cabinet, 36" table rack, RCA 30" cabinet; BC-610 modulation transformer, pair unused 810 tubes, pair RK-38s. J. I. Leskinen, 33-45 172nd St., Flushing 58, N. Y.

SELL OR TRADE — Antique radio collection; 300 A-1 radio-TV cartoned tubes; Riders, Sams, Zenith, RCA service manuals; small radio parts. Send stamped envelope for list. Cash or antique auto items wanted. Harold Garrett, 711 South New York, Sedalia, Mo.

WANTED FOR CASH — CREI complete home study courses, Sections 1, 2, 4, 5, M, Practical TV Engineering, TV and FM Servicing; also others on Industrial Electronics. Alexander Benincasa, 5701 N. 7th St., Philadelphia 20, Pa.

WANTED — Mobile equip. for 10 meters, also converter for fixed station covering 10-15-20 meters. C. Stouth, Box 378, Secane, Pa.

TRADE — Popular Science from 1941 to date for Riders manuals. Milton Leiser, 305 E. Mt. Eden Ave., New York 57, N. Y.

FOR SALE — Gen. Elec. UPX-004 ball bearing tone arm, takes triple-play cartridge, 5 grams pressure; Gen. Industries 3-speed DSS turntable, like new. Both for $10 FOB. E. Hill, 10 Plumtree Rd., Levittown, Pa.

SELL OR TRADE — Zenith 7H918 FM and 7FO2 AM-FM radios; Westinghouse radio H448T4. All unused. Joe Billingsley's Radio Service, Hardy, Ark.

WANTED — To buy, rent, or borrow, instruction manuals for Weston model 788 V.T. analyzer; Weston capacity meter model 664 and model 665 type 3 analyzer. John G. Filomeno, 7419 13th Avenue, Brooklyn 28, N. Y.

WANTED — Wood baffles for 4-inch spkr, new, surplus, or used in good cond. Advise quantity, condition, and best price. L. Buddine, 1700 W. High St., Haddon Heights, N. J.

FOR SALE — 3" port. scope; SG-6 sig. gen.; T-2 sig. tracer; AC-DC radio; "Handee" power tool with accessories; "Radio & TV Math." Stanley Bombka, 8107 N. Odell Ave., Niles, Ill.

SELL OR SWAP — Model S-81 Hallicrafter Civic Control rec., 152 to 172 mc., FM. Want good 30 to 50 mc. Police Alarm. H. H. Riley, Rt. 4, Box 346, Aiken, S. C.

FOR SALE — Long-wave rcvrs: RCA AR-8503, 15 kc. to 600 kc., $45; BC-314-F, 150 kc. to 1500 kc., $45, both with power supplies, postpaid and insured. Charles W. Leigh, 162 Passaic St., Trenton 8, N. J.

WANTED — Teletype printer, model 12, 15, 18, or 26, prefer newer model; surplus BC-611-F Handi-Talkie. Prefer local contact. Richard Ebeling, 33 Randolph Rd., White Plains, N. Y.

WANTED — 3" or 5" TV rcvr or 7" port., must be in working order, reasonable. State price, first letter. Raymond Fisher, 627 Fallowfield Ave., Charleroi, Pa.

SELL — Complete amateur station: calibrated VFO, National NTX-30/NSM modulated exciter, 200 w. linear, National HRO 500-30,000 kcs., relay controlled, indiv. power supplies, metal enclosed rack, etc. Bargain at $450. O. E. Simms, 14 Nichols Rd., Reading, Mass.

FOR SALE — Collins plate xformer, C.C.S. ratings, multi-tap pri., semi-sealed, 1100 v.c.t. at .212 amps, $12, 5 v.c.t. at 15 amps, $5. Also chokes, oil capacitors, and others. A. Miller, 1889 Webster Ave., Bronx, N. Y.

TRADE — Unused Webcor wire recorder, all accessories; and Model 40 Multiith offset machine. Want late model typewriter or amateur equip., rcvr and xmtr. Dave Fisher, Box 125, Monroeton, Pa.

SELL — Jackson CRO-2 scope $159, and TVG-2 sweep gen., $139, both in factory new cond.; Hickok 600A tube tester, l. n., $110; Hallicrafters SX16, A-1, $55. L. F. Kirkman, 2444 D St., Lincoln 2, Neb.

FOR SALE — 25 Sams Photofacts with six binders, $30. Leonard A. Becker, 14101 Clairview Ave., Cleveland 11, Ohio.

FOR SALE — Sams Photofacts 90 thru 216 (9 binders), $125. M. E. Tyson, 848 Colfax St., Toledo 6, Ohio.

FOR SALE — 152-162 FM 40 w. xmitter with dynamotor and 12-tube crystal controlled companion rcvr 6 v. with tubes, $95. J. Conrad, 12908 Lorain, Cleveland 11, Ohio.

FOR SALE — Master mobile mount antenna complete with mount and 75 meter coil, like new, $12.50; Meissner radio phono-recorder includes PA system, like new, with instructions, $85. J. Whitley, 133 Airsdale Ave., Long Branch, N. J.

WANTED — 80, and 40 meter coils for Hallicrafter HT-9 xmitter. Cash. Duane G. Lang, Vienna Route, Dixon, Mo.

SELL OR TRADE — 1800 radio-TV tubes, standard brands, ind. boxed; min. GT and G; lot for $.25 each, or make offer. Cardinal Electronics, R-1, Box 4, Grayslake, Ill.

FOR SALE — Low price: Radio generators DC, 500 v., 17/1000 v., 1600 v., 1500 v., 15/750 v., all unused. Electric Maintenance Service Co., 143 Bennett St., Bridgeport 5, Conn.

FOR SALE — Hi-Fi Bogen R-300 AM-FM tuner with preamp. and detector output for tape, exc. condition, $60. Joseph D'Amico, 854 E. 175th St., Bronx 60, N. Y.

FOR SALE — Pair broadcast coils for HRO-7, $18; UTC PA-4L6, $8.50; B&W butterfly transmitting condenser CX-34-B, pair of N-3 neutralizing condensers, coil mounting angles, UTC varitian V-3-B, 3.5 amps., 115 v. AC, $5. Macy, 2346 Dundee Rd., Louisville 5, Ky.

FOR SALE — Best cash offer: Hickok 195-A; Heathkit 03 oscilloscopes, V1 VTVM, and G2 sig. gen.; Webcor 80-1 wire recorder; Weston 777 tube checker; BC-459 xmitter. All items good working order. Leo Walsh, RD 1, Warners, N. Y.

WANTED — All types of surplus and special purpose, TV and radio tubes in orig. cartons. Must be new. State prices. Philip Rosenfeld, 297 Central Ave., Bethpage, N. Y.

FOR SALE — Harvey Wells TBS-50C transmitter with matching VFO and VPS-50; 12 v. dynamotor. Exc. condition. All for $100. William C. Woods, 43 Richardson Rd., Lynn, Mass.

FOR SALE — Heath 0-10 oscilloscope, factory calibrated, never used; Globe King 400-B xmitter, all amateur coils, and Lysco 600 Transmaster VFO. All in like new cond., no TVI. E. E. Marriott, 1502 Llano St., Port Neches, Tex.

FOR SALE — Heath SG6 AM sig. gen., $15; Heath scope 07 modified to 08, $30; Scala low capacity scope probe, $5; Rytel CRT rejuvenator, $7.50; Sams Photofacts, $.75 per folder; plus postage. L. Miller, 417 Wagner Ave., Washington, Ill.

TRADE — For TV test equip., Winchester model 90 22 WRF, and JC Higgins 12 ga., bolt action. What have you? W. B. Parysch, Box 174, Carlsbad, Calif.

FOR SALE — 3 lb. roll of No. 33 enamel wire, will ship postpaid for $3.50. L. Cohen, 151-09 34th Ave., Flushing 54, N. Y.

SELL OR TRADE — Precision 920 dynamic electronometer and tube tester; NRI 88 sig. gen.; Heathkit VTVM model V-6 with HV probe; Superior CRT tester, model TV-40. Instructions included. Joseph Nardi, 4157 Eierman Ave., Baltimore 6, Md.

FOR SALE — Eico 425 scope, never used, and 221 VTVM, sig. gen., tubes and parts. Very reasonable, local only. I. Gelenter, 80 Van Cortlandt Park So., Bronx 63, N. Y.

FOR SALE — National S-0-J, $8; Mon-Key Monitor and electronic key, $20; 80 m. VFO and power supply, $10; Eicor dynamotor, 12 v. input, 440 v. 200 ma with base, hash filters, Amphenol connector and starting relay, $12. Neil Spencer, Box 482, Pinellas Park, Fla.

WANT — Complete VHF-FM 2-way mobile unit for 6 v., antenna, dynamotor, mike, control head, xmitter, rcvr, for 30 to 50 mc. band. Need not be licenseable. State cond. and best price. Leo Liebl, Medford, Wis.

FOR SALE — BC-312-N with external pwr supply; two BC-453-B (190-500 kcs.), and one external power supply; 21 mc. convertor. All for $100. Walter Hladky, 7 Warwick Rd., Chatham, N. J.

WANTED — Trade up to $400 in U. S. stamps Harris value your choice for late model 630 type console in 21, 24 or 27" screen. Prefer UHF tuner in A-1 cond. Gable Stamp Service, 18456 Gable St., Detroit 34, Mich.

FOR SALE — Radion battery field strength meter, l. n., $60 prepaid; two PE-103 power supplies, perf., $30 each, freight collect. F. D. Greenlee, Box 1229, El Dorado, Ark.

FOR SALE — Books: Principles and Practice of Radio Servicing by H. J. Hicks, Basic Radio Principles by Maurice Grayle Suffern. Both in good cond., $1 ea. FOB. V. H. Grey, 121 Seville, Ormond Beach, Fla.

FOR SALE — Volumes 1 thru 10 Riders Service Manuals, all in good cond., $50 FOB. W. D. Alkire, 2011 Green Bay, La Crosse, Wis.

FOR SALE — Vols. 12 and 13 Riders Radio manuals, $6 each; also auto trailer, box type, half-ton capacity, $40. Edgar J. Reynolds, 119-59 178th Pl., St. Albans 12, N. Y.

WANTED — ARC-3, 8 or 24 channels, give cond. and price. M. Colbert, 310 West 93 St., New York 25, N. Y.

WANTED — Gonset triband converter or equiv. A. W. Tandy, Waverly, Iowa.

FOR SALE — V.M. Tape-O-Matic tape recorder, never used, $129, and V.M. Hi-Fi phonograph, $105, complete. Both unused, and prepaid. H. W. Johnston, 825 NW 13 Ave., Gainesville, Fla.

FOR SALE — Triplett 666R VOM, l. n., $18.50; Pickering cartridge 260 D.D., perf., $40; unused Central Electronics 20A, SSB exciter, $215. A. R. Dayes, 29 Charles St., Merrick, L. I., N. Y.

FOR SALE — Stepping switches, $6 each; 10 WE 206BD, 3 decks 22 pos., 100 ohm coil, requiring 250 mils to operate; 1 AE, 3 deck 22 pos., coil 12 v. DC, 10 ohms. Emil Backstrom, Jr., 6 Pel Place, Pelham, N. Y.

FOR SALE — Millen exciter, power supply, coils, three 7 mc. crystals, S-38 rcvr., Vibroplex bug, all in first class cond., $75 takes all or make offer. J. Bisbee, 86-37 111th St., Richmond Hill, L. I., N. Y.

TRADE — Kodak Poney 135 camera, Williamson 25 w. Hi-Fi amp., 1 304TL perf. shape, like new .22 rifle. Want comm. rcvr and/or xmitter, send details. Ron Toller, 215 Gray, Zanesville, Ohio.

FOR SALE — Reconditioned 1937 to '56 auto radios, custom built. De Marco's Radio TV Shop, 193 Pine St., New Haven 13, Conn.

SWAP — Buick push-button radio, 47-50 model, exc. cond. Want Acrosound TO-300, repairable scope, small TV, or good spkr. Denver F. Moffett, 107 Quincy St., Clarksburg, W. Va.

FOR SALE — Supreme 546 oscilloscope, $30; Heathkit T-2 sig. tracer and C-2 condenser checker, $20 each; Weston 571 output meter, $15. All in good cond., cash only. Geo. Javor, 3119 East Erie Ave., Lorain, Ohio.

WANTED — 16 mm. silent projector. Will sell UTC S-4 Class A input 1:1, and UTC S-19 30 w. unused transformers, and books by Wm. Mortensen. Denny Radio Service, Portersville Road, Washington, Ind.

FOR SALE — Hickok 600A tube tester, factory perf. cond., best offer over $125; high grade Violin output; short-wave, high quality tuning conds., and parts, old tubes, magazines. John Kadletz, Chatfield, Minn.

FOR SALE — Concertone model 1501, used less than 50 hours, A-1 cond., must sacrifice for $285. L. M. Stone, 1409 Ford Ave., Tarrant 7, Ala.

WANTED — Heath or Eico color scope and Precise model 111 tube checker in A-1 condition only. S. Cutler, 1954 Union-port Rd., New York 62, N. Y.

SELL OR SWAP — BC xmitters, rcvrs, modulators - PE103s, 1.5 kw. 2400-2400 v. sec., 110-220 v. pri. xformer, 10 mfd. 1000 v. cond. Need 500 mil choke, 500 w. multimatch mod. xformer, BC-221 freq. meter. H. E. Owen, Box 851, Alfred, N. Y.

FOR SALE — 701A Tetrode, similar to 4-250A, 10 w. to drive 1 kw. AM phone, fil. 8 v. @ 7.5 amps, plate 3000 v. @ 200 ma., $4.95 each. M. Rafuse, 297 Central Ave., Bethpage, N. Y.

WANTED — Offset printing press, prefer multilith model 1250, or multigraph folding machine model 1520 or 1511, and exposure frame to photograph masters. Will trade radio parts or cash, state cond. and price. A. G. Voda, 90-51 199 St., Hollis 23, N. Y.

WANTED — Recently completed Radio-TV Course with all kits incl. TV set, may be assembled, prefer RCA, Sprayberry, or NRI; Rider's TV manuals 1-17 and Sams Vol. 1-28. Frank Odziana, 20814 Blackmar St., Van Dyke, Mich.

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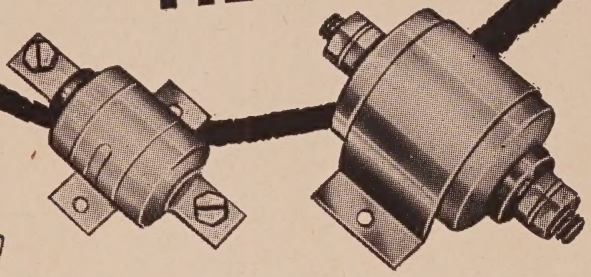

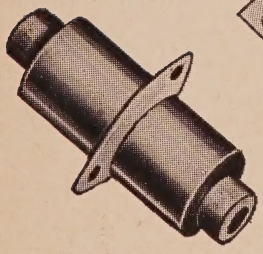

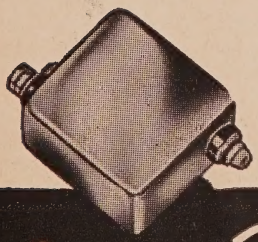

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